



Aalborg Universitet

AALBORG UNIVERSITY
DENMARK

From Traditional to Modern Universities

The Ambiguousness of Researcher Incentives in a University-Industry Collaboration Perspective

Nielsen, Anja Birch; Sort, Jesper Chrautwald; Nielsen, Christian

Publication date:
2012

Document Version
Early version, also known as pre-print

[Link to publication from Aalborg University](#)

Citation for published version (APA):
Nielsen, A. B., Sort, J. C., & Nielsen, C. (2012). *From Traditional to Modern Universities: The Ambiguousness of Researcher Incentives in a University-Industry Collaboration Perspective*. SSRN.
<http://ssrn.com/abstract=2192409>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

Take down policy

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

From Traditional to Modern Universities: The Ambiguousness of Researcher Incentives in a University-Industry Collaboration Perspective

Authors

Anja Birch Nielsen, Jesper Chrautwald Sort and Christian Nielsen

Abstract

This paper reports a longitudinal multi-case research project encompassing 72 semi-structured interviews carried out in 2011 and 2012. The interviews covered topics of the collaboration between university and industry, why they were engaged, who benefitted from it, the initial motives and final results. In addition the interviews tried to focus on whether the industry understood the motives of the university to engage in collaboration and vice versa. Focusing on whether the performance measurements used by politicians and universities today enhances the collaborations or obstruct them. The paper concludes that the performance management used today in universities in form of publications is overlooking the industries' need of growth from the university knowledge. Hence motivating the scientists to engage in collaborations only from the university point of view and only to a limited extent concerning about the companies.

Key words

University-Industry collaboration, performance measurement, performance management, incentives, roles of universities

Introduction - Universities traditional and now

There are many ways to describe the culture within universities and essentially what a university is, but one of the newer, cited and used is Dearlove (2002) that describe universities as: “*Universities are essentially seen as communities of scholars where research, critical thought and the dissemination of knowledge takes place.*” With this citation Dearlove (2002) explains the fundamental of a university as being knowledge edification. Kok *et al.* (2010) describes traditional values of universities as promotion of academic freedom and autonomy for scientists, and the primary focus of a university is academia, but these values of universities are changing (Van Dierdonck *et al.*, 1990; Mouwen, 2000; Kok *et al.*, 2010). Among others demand has forced universities to shift their focus from elite education to mass education (Van Dierdonck *et al.*, 1990, Westerheijden *et al.*, 2007, Kok *et al.*, 2010). At the same time the raise of new thoughts in society has led to the implementation of the New Public Management philosophy as the main management approach in the public sector and universities. In the past decades among others this has resulted in an emerging focus on universities main activities (The Danish University law § 2, 1.). In the past these were primarily teaching and research, but now a third core activity has been added, the engagement of universities in the development of business and society in general – contributing to the development and innovation of industry and society by implementation of knowledge, which adds further to the changing role of the universities. (Barnes *et al.*, 2006; D’Este & Patel, 2007; Lundvall *et al.*, 2008)

The shift in university values and core activities can be explained by how the surrounding society wants to take advantage of the knowledge being created at the universities. Governments and companies see implementation of knowledge as an opportunity to gain competitive advantages, which have led to a public demand, about universities seeking collaboration with the industry and surrounding society. (Van Dierdonck *et al.*, 1990).

With these demands it would be plausible to imagine that funding from the governments would rise, but the opposite happened, and since the 1970s the universities have experienced an increase in numbers of students but reduced public funding (Kok *et al.*, 2010). This forces the universities to think in new ways, both being more effective and maintaining the high quality (Frølich *et al.*, 2011). Managerialism and bureaucratic considerations in many universities are reducing academic freedom and autonomy while promoting accountability. Creating the need to move universities towards an institute that provides education to the masses, while being efficient, effective and

economical, in turn this decreases the scientists' freedom and autonomy (Kok *et al.*, 2010). In the following this paper will explore the theoretical perspective on the values of universities, and is structured so that the next section describes the theoretical framing of the paper by looking into the incentives of the partners of U-I collaborations, where after the methodology will be presented and the empirical evidence. Finally the paper will summarize its findings in a conclusion – in relation to our thoughts on the following effects of the findings.

Theoretical framework

New opportunities with U-I collaborations

The changing values of universities, from pure academic freedom to more efficiency and knowledge-transferred orientation, have created opportunities but likewise concerns for the modern university. With the entrance of U-I collaborations, there has been a comprehensive discussion whether these collaborations can generate opportunities for the universities such as funding, enhanced science and pedagogic (Van Dierdonck *et al.* 1990). Collaboration also have some potential concerns like moral codes, freedom of publication, freedom of scientists (Van Dierdonck *et al.*, 1990).

One of the main issues since the progress of U-I collaborations was that scientists would lose their freedom to choose research direction, including ground research, rather than exploring applied science and be dictated by companies (Van Dierdonck *et al.*, 1990). Van Dierdonck *et al.* (1990) studies show a natural, tendency that universities that collaborate with industries are more oriented towards applied science, than universities without U-I collaborations. While Gulbrandsen & Smeby (2005) establish that among universities with external funding from industry, scientists still consider around 40% of their work to be ground science, where universities without external funding do around 55%. Universities with other types of external funding characterize 65% of their research as ground science. Van Dierdonck *et al.* (1990) further uncover that both universities with U-I interactions and those without show no significant difference in the limitation of choice in research topics. Likewise the concern that applied science will lead scientists to fewer publications is weakened with discoveries from Zucker & Darby (1996), Siegel *et al.* (2004), and Gulbrandsen & Smeby (2005) that find scientists doing U-I collaboration have a higher scholar productivity.

The decrease in public funding has been a problem for many universities, and literature describes that the need for profitability, marketization and commercialization has obscured the universities (Gibbons, 2005; Kok *et al.*, 2010). Likewise there has been an increasingly share of public funding being performance based, giving that universities have to deliver according to public demand (Frølich *et al.*, 2011). Frølich *et al.* (2011) however explore that different Norwegian universities have benefited from these new funding forms with no greater disadvantages, but also conclude there is no single strategy that is universally beneficial for all universities. Kok *et al.* (2010) and Van Dierdonck *et al.* (1990) bring matters more to a head, stating that funds from industry can be crucial for universities to maintain quality and leading position. Kok *et al.* (2010) examine how traditional universities (Cambridge and Oxford) gain funds from former students through private funds, but smaller and younger universities do not have such opportunities. Van Dierdonck *et al.* (1990) outline that collaboration with industry may enable a much wanted raise in funds, and their research found that universities with U-I interactions tend to have 3 times higher funding than universities without interaction.

Motivation and performance management at universities

New Public Management involves the use of private sector methods in the public sector (Hood, 1995), and when it was introduced to the universities, this also included Performance Management. This new performance measurement system focuses in many countries on publications in academic journals as being the primary indicator of research performance. Performance Management has traditionally been used in a developmental manner at department level, which should identify the scientists' individual strengths and weaknesses. Now there is an increasing use of Performance Management in a judgmental manner, evaluating past performance, *'which seems to be closely related to performance measurement in NPM, and is usually implemented at a more centralized level'* (Bogt & Scapens, 2012; p. 455). The effects of this are far from clear but various negative effects show that among others contributions from universities to the outside world are limited (Bogt & Scapens, 2012).

The traditional goals of universities being measured raise the question of whether the traditional goals in consideration to the modern universities goal still should be taken into consideration. Are they just compatible with the traditional goals, or are new goals needed, to ensure the scientists are directed towards the new as well as the traditional goals. Kok *et al.* (2010) describe how universities are starting to have more focus on the U-I collaboration, as there is an opportunity for funding

supplementing the lower public funding and additional publications spreading the reputation of the university. But no real measurement of these new organizational goals has been found, and therefore this is the first proposition in this paper: *“Which goals, measures and incentives are used at the modern university to keep its employees in line with the organizational goals?”*

Kok *et al.* (2010) and Frølich *et al.* (2011) both describe how managerialism has become more pronounced at universities exemplified by more and specific performance measurement regarding the number of hours are spent on lecturing and research publications. These goals and measurements are set to make sure that the workers (scientists) are directed and supported to work in accordance with the organizations (university) goals. (Bratton & Gold, 2007). Such measures have existed in many years, but in an indirect manner, while the performance measurement was introduced with the new ways of funding (Frølich, 2011). These traditional measures are transferred to the modern university, and in turns some scientists get their contracts renewed or need to reach specific goals before they get promoted.

However apart from resulting in an increase in research output (the intended effect/goal) the use of the judgmental performance measurement system can, also result in the researchers playing safe, working on easier publications – not letting their research live up to their real potential. (Bogt & Scapens, 2012). This narrowness in the research will only result in marginal contributions to the literature, and can in the end damage innovation and creativity. (Lukka, 2010). Another proposition in the literature addresses how measurement systems affect academics when these objective measures of research and teaching are being applied (Bogt & Scapens, 2012). It must therefore be noted that as the performance management system was introduced to the universities, and the implementation of this changed from being a developmental manner towards a judgmental manner – the effects of the implementation of performance management was changed – from affecting the intended greater research output, when measured on publications, to also include indirect effects such as narrowness in research among others again affecting the role of the universities in society, and indirectly the universities’ third core activity.

As noted above the Danish universities’ third core activities have been mandated by the government through the university law. This is a general tendency in the OECD submitting third core activity by law to force collaboration to take place, the policy makers aiming at involving all higher education institutions as partners in a nationally balanced socio-economic strategy (Hazelkorn 2005).

Findings by Hazelkorn (2005) explain that in recent years more governments have begun to think strategically about the economic significance of academic knowledge production, asking how higher education can be restructured to become a more effective and efficient economic driver.

“Today governments think very strategically about research institutions because of the knowledge production in now closely linked with the geo-political positioning of nations. New knowledge is today produced by a number of organizations in the private and public and in partnerships between these – hence the complex global knowledge industry.” (Hazelkorn 2005, pp. 148)

Hazelkorn's (2005) study raises issues about the relationship between institutional behavior and government policy just as the discussion of this paper in relation to NPM and Performance management does. Findings are that there is a need to bridge the gap between government policy and institutional aspirations and strategy. Tensions have arisen between institutional mission and government policy, institutional priorities strongly reflecting national priorities and funding agency criteria, and success depends on change both within the institutions and within governments. On top of that there is a general tendency of research institutions to embrace strategic alliances with industrial partners. (Hazelkorn 2005)

So the theory clearly explains the development and motives of government and research institutions to pursue collaboration with the surrounding society and industry partners – but the literature in general lack explanation of the motives of the industries to collaborate.

Data and research methodology

The examination of how performance measurements affect project collaborations between universities and industry constitutes the empirical part of this paper. A qualitative approach will be used to address this issue, and the study is based on semi-structured interviews with the 72 key participants from collaborating organizations, where the respondents have been the main contacts and responsible project managers from both the university and the companies.

Data collection

The empirical foundations of this paper are 72 semi-structured interviews conducted over the period 2011 to 2012 around a total of 38 university-industry collaborations. Each interview ranged from

between 60 minutes to 90 minutes. We aimed at identifying university-industry collaborations that covered projects between companies in different industries and researchers at different faculties. Identifying company/researcher collaborations was done with the help of Aalborg University's contracting unit official database. The respondents were selected so as to give a balanced insight into different types of collaboration, industries, different stages of collaboration, and different project sizes.

The form of interviewing chosen was based on the principle of dialogue between the interviewer and the respondent (Kvale, 1996) and has some similarities with the type of interview that Yin (1994, 84) calls "focused interviews". The interview guide is divided into sections from the stage model and questions about these, with the addition of follow-up questions. The emphasis in the interview is not to strictly follow the guide, but let the respondent talk freely, naturally still making sure to address all main topics. To secure that the needed data was collected there were at least 2 interviewers present at each interview, one talking and ensuring a good interaction with the respondent, and one taking notes and securing that all main topics were covered, this approach is also suggested by Yin (1994). The interviews probed into five themes, which reflect the purpose of the paper, and these in turn therefore constituted the main sections of the interview guide:

1. Introductory questions concerning the respondent and his/her organisation
2. Questions addressing the different phases of a collaboration/
 - a. Contact phase
 - b. Initiating the collaboration
 - c. Project phase: conceptualizing, planning, executing
 - d. Completion phase: concluding, evaluating renewing
3. The overall cooperation of the relationship

During the interview process we asked for extensive amounts of examples and stories as reflexive-type questions much in the manner described by Kreiner & Mouritsen (2005). In this way we aimed at forcing the respondents to explain what really goes on during their workday and also to stimulate them to provide details and thoughts that were more detailed than we otherwise would expect to get.

Analyzing the data

Immediately after finishing each interview the interviewer wrote a brief resume of the main points according to the three themes of the interview guide. Here we aimed at noting down exceptional examples or particularly interesting points being made. The interviews were transcribed in their full length and we applied a structural coding approach in the analysis of them along with the lines of Krippendorff's (1980) recommendations. This coding tree was based on the full interview guide. After coding the interviews, a list containing the drivers of project management, project success and project management success considered critical by the interviewed respondents was prepared. The data-analysis was initiated by searching for patterns in the subsection of the case study database that was specifically focused on the codes for this paper. From this a set of working proposition was generated and they were supported through analytical generalization.

Empirical analysis

U-I collaborations in the modern university should be seen as a result of the new third core activity of the universities, and will therefore also be affected by the universities performance management system when evaluated. Measuring and assessing the quality of the U-I collaboration should therefore be seen from the perspective of both the universities and the industries. From the theoretical framework it would be expectable, that the findings would be characterized typically as measurements being defined by knowledge transition resulting in data production to be used for research and in the end publications. The findings from the industry should on the other hand regard the knowledge transition as a mean for growth following the thoughts of the third core activity.

Goals of the collaborations

The interviews first of all shows that on a general note both parties are satisfied by the collaborations, and the initial goals of the collaborations are achieved, which the follow quotation from a project manager from the industry is representative of: *“Generally we are satisfied with the collaboration, and our goals that were established in the early stage were met.”* The corresponding scientist replied similar when asked to the goal fulfillment of the collaboration and the satisfaction with the project. This would indicate that the universities' third activity both satisfies the industry and the university, again pointing out that these citations are not representative of all the interviewees.

Another point from the Van Dierdonck *et al.* (1990) is that funding has to be raised in these collaborations, but as Gibbons (2005) stated, this could derive problems in the collaborations since this should not be a foundation on which to build collaborations. This funding issue has given rise to some consideration, in the cases where the industry partners have felt exploited due to the funding within the project, in these cases the industry partner has not been an active partner. But the problem typically arises, when scientists wanted to conduct research in a specific area, but could not find the funds alone and had to find a company, just as the following citation illustrates: *“No, the government demanded that a collaboration partner (a company) was present, otherwise we would not get funding.”* The question is whether these collaborations ever should take place, as it can be seen as a negative effect of the third leg, that universities and industry have to collaborate, and the scientists do not have the same academic freedom as earlier.

The concerns in this direction are found to be a minority in the collaborations, where the majority of the collaborations both take advantage of the possibility to gain access to public funding both helping the university and the industry, thereby strengthening the collaboration. A company stated this as: *“To be honest, one of the things they (the collaborations) are enabling us to do, is seeking funding, because much of the public funding is achievable if the universities are in the collaboration.”* This citation shows that it is not only the wish for knowledge transition growth that inspires the industry to collaborate. Some collaboration also enables the companies to pursue funds in the present. Scientists, who collaborate with a company - aiming at a mutual goal, use this opportunity *also* to gain funding: *“We need money to do research, and the majority of it is based on government funding. And the allocation of this funding is accessible through the companies we collaborate with.”* The main focus being the collaboration, which was in place or was agreed upon – as was the common goal, whereafter a second objective, funding/ money, arose as a collaboration spin off.

Motives to engage in collaborations – getting behind the goal setting

This spurs the question of motives of the partners collaborating – and whether both partners understands the opposite partners incentive to join the collaboration. Given the universities third mission as the main reason for collaboration, this question could be easily answered addressing the benefits of society, industry and university (addressing the articulation of the Danish university law). In short the university provides knowledge for the industry, which in the end should be translated into growth – at the same time the industry provides the university with data, empirical

evidence for further research in the end resulting in publication. (These goals could also be seen as a long term goal for the industry, and short term goal for the university).

Given this it is surprising, that the empirical evidence showed only a minor understanding of the opposite partners incentive for collaborating. It was expected that scientists would consider publications as a driver for the collaborations, since this is one of the performance measurements used by the university illustrated with this citation:

“I have had good opportunities to do research and furthermore the collaboration enabled me to put my research in practice, and doing what a scientist gets measured by in our system (Norwegian University), namely getting publications”

This focus on publications was found in all the interviews with scientists.

Again this could be expected giving the performance measurement used by the universities, but still surprisingly is that close to none of the scientists spoke of the third core mission, only addressing knowledge transition – but not linking this to growth in the collaboration with industry.

The empirical evidence addressing this topic from the industries perspective, clearly showed an understanding of the scientists goals – these were articulated as:

“Basically it is a question of producing publications and getting these published. That is their (the scientists) main goal, and there is not much to do about that.”

This point was made by almost all companies discussing the collaboration incentives and motives of both parties. This points towards companies understanding the motives and incentives by the scientists, and the scientists being very good at articulating and sharing their motives for joining in collaboration.

This is not by any means considered a problem – it only shows the different parties’ ability to understand the opposite. But if a dialectical approach of understanding is needed to fulfill the collaboration from both perspectives, the lack of genuine understanding will lead to problems.

Many scientists turn to the general goal proposition for the collaboration, when trying to explain the industries motives for collaborating – a general goal formulated by politicians. When being specifically asked about the collaboration they were a part of, they turn to the generally formulated

goal of the collaboration, which they hardly ever can remember, but they believe that the industry have gained access to new knowledge they can use:

“We meet the goals set in the beginning... They got some new knowledge which was one of the goals in the collaboration”

“... We have produced a popular science publication, and got a publication in an international recognized journal. So we think, we have produced results in the collaboration.”

The first of the citations is a clear indicator of the scientists' awareness of knowledge transition in the collaborations, and in many collaboration cases this is also formulated as a goal in the beginning of the process. But the question about, whether this knowledge transition is operational in the company, is seldom defined as a goal and likewise seldom addressed during the interviews with the scientists! The second citation is also interesting, when addressing the industries' gains from the collaboration. Again this should not be seen as a problem, as long as the industry clearly knows what they gain, which should be addressed during the interviews:

“They (the scientists) do not have the same goal, as we do. We have to acknowledge that fact and need to be aware of it when creating collaborations (with universities). As mentioned, their (the scientists) goal is not to create a business area on which we can earn money. This is our main reason. We knowledge sharing, because we need some information and knowledge to create new business areas and create further turnover... Their (the scientists) goal is to create some publications to journals and get recognition and maybe use it when lecturing. Which is fair enough, we have different approaches to the collaboration.”

While citations like this could be expected to be in the majority, the opposite was the result – the citation was part of a minority, as most of the industries answers focused primarily on the scientists' goals:

“In the collaboration there have to be some research, which will come in term of a PhD student and publications. Especially the publications are the main driver. That is the proof of our collaboration.”

The citation clearly defines when the performance management system becomes a problem for the collaborations overruling any other goals, and drives the industry to focus on the same goals as the scientists and the university - thereby not necessary for fulfilling the third mission, but actually

going in the direction of the traditional universities values. This is underpinned with this citation from a scientist:

“In other terms, the scientific publications we can produce on the behalf of this (collaboration), is the criteria of success, and we believe it will be accomplished.”

But why are the motives and incentives so clear from the universities? One of the explanations could be, that the universities always have a clear goal when joining collaborations, whereas companies are more diffuse. This could be addressed by the university departments telling the scientists to consider the companies more in the collaborations to fulfill the third mission, but is this in line of the performance management of the departments? One scientist was very clear about the performance management of the university:

“The production requirements are straightforward, if you are employed as a scientist here (Danish University), then you have to publish, and if you do not create publications, then you are, as the vice-chancellor articulates it, a zero scientist, and then you lose your right to conduct research. Straight forward like that. If we cannot produce any publications within the collaboration we have, then we need to consider thoroughly before engaging, because we need some incentive to engage.”

The findings in this paper clearly indicate that the goal of third core activities, formulated by the politicians, has been fulfilled. But the empirical evidence is pointing towards a skewed collaboration, where obviously the scientists are talking about and executing their motives and incentives. But surprisingly the companies are likewise primarily talking about the scientists' motives and incentives, when looking at the results of the collaborations. And where does this leave us?

Concluding remarks

The perspectives of the different partners in a U-I collaboration differ, as do the motives to collaborate. The one thing that both partners have in common is their focus on external funding, which as noted earlier can be seen as a motive for collaborating, but funding doesn't seem to be a criteria when evaluating the collaboration – here only publications are in line.

The empirical evidence from the KASK:VIE project shows a shared focus among the partners of a U-I collaboration, when it comes to evaluating the motives of collaboration and outcome of a

project. The empirical evidence clearly shows how both the external and internal partners focus on publications as a measurement of the results of the collaboration, even without this having any measurements implications for the industry, who traditionally focus on growth through knowledge transition from the universities to the industry in the U-I collaboration.

Researchers performance is normally measured by the number of publications in academic journals, this is probably why a collaboration between universities and industry also is being articulated, by the partners of the U-I collaboration, in relation to publications. It seems that the scientists are very good at articulating their focus of collaboration to the industry, which doesn't question this but sees this in relation to their goal of growth through knowledge transition. The scientists' perspective on the outcome of collaboration affects in other words the industries way of seeing a result of collaboration.

What is interesting is how well an indirect goal of publications through data gathering and knowledge transition benefits the industry.

Another interesting perspective is the effect of the performance management culture on the collaboration. When both the scientists and industry clearly identify publications as the goal of collaboration, and publication only plays a real role for the scientists then it might be suggested that the NPM and Performance management culture has affected the universities' third aim – to develop industry and society through knowledge transition. This collaboration goal is now focused on with publication from both partners, a goal which should only be shortterm - and a goal solely for the scientists, instead of evaluation of the knowledge transition that has taken place – in short term, and a long term evaluation of the growth directly happening as a result of the knowledge being implemented in the U-I collaboration.

A proposition could be that the goal of publishing is affecting the collaboration in a less positive manner when seen from the industries perspective, maybe the measurement of scientists' performance should measure not just on publications but also on the scientists' collaboration with the industry?

If we as a society and as scientists want to fulfill the universities' 'new' mission – being an economic driver – we need to organize in accordance to outcome – not letting the changing management philosophy and the tools of this (PM) affect the chances to meet the society and

industries demand for knowledge, which should be regarded as a high prioritized research agenda in the near future.

References

- Barnes, T., Rashby, I., Gibbons, A., (2006), "Managing collaborative R&D projects development of a practical management tool", *International Journal of Project Management*, 24, 395-404
- Bratton, J. & Gold, J., (2007), "*Human Resource Management: Theory and Practice*", Galgrave:McMillan
- D'Este, P. & Patel, P., (2007), "University–industry linkages in the UK: What are the factors underlying the variety of interactions with industry?" *Research Policy* 36, 9, 1295-1313
- Dearlove, J., (2002), "A Continuing Role For Academics: The Governance of UK Universities in the Post-Dearing Era", *Higher Education Quarterly*, 56, 3, 257-275
- Frølich, N., Waagene, E., Aamodt, P.O., (2011), "Old Players – New Rules: Higher education institutions' response to educational demand", *Tertiary Education and Management*, 17, 2, 163-179
- Gibbons, M., (2005), "Choice and responsibility: Innovation in a new context", *Higher Education Management and Policy*, 17, 1, 9–22
- Gulbrandsen, M. & Smeby, J.-C., (2005), "Industry funding and university professors' research performance", *Research Policy*, 34, 932-950
- Henk J. t B., & Scapens R. W., 2012, "Performance Management in Universities: Effects of the Transition to More Qualitative Measurements System", *European Accounting Review*, vol. 21, 3, 451-497
- Hazelkorn, E. (2005) 'University Research Management, Developing Research in New Institutions' OECD Publishing
- Hood, C. (1995) "the 'New Public Management' in the 1980s: variations on a theme", *Accounting Organizations and Society*, 20(2/3), 93-109
- Kreiner, K. & Mouritsen, J., (2005), "The Analytical Interview – Relevance beyond Reflexivity", in Tengblad, S. & Czarniawska (eds.), *The Art of Science* (Liber, Malmoe)
- Krippendorff, K., (1980), "*Content Analysis: An Introduction to Its Methodology*", Sage, London
- Kok, S.-K., Douglas, A., McClelland, Bryde, D., (2010), "The Move Towards Managerialism: Perceptions of staff in "traditional" and "new" UK universities", *Tertiary Education and Management*, 16, 2, 99-113

Kvale, S., (1996), "*Interview - en introduktion til det kvalitative forskningsinterview*", Hans Reitzels forlag

Lukka K., (2010) Introduction: the roles and effects of paradigmes in accounting research, *Management Accounting Research*, 21(2), pp. 110-115

Lundvall, B.-Å., Rasmussen, P., Lorenz, E., (2008), "Education in the Learning Economy: a European perspective", *Policy Futures in Education*, 6.6, 681-700

Mouwen, K., (2000), "Strategy, structure and culture of the hybrid university: Towards the university of the 21st century", *Tertiary Education and Management*, 6, 47-56

The Danish University law, <https://www.retsinformation.dk/Forms/r0710.aspx?id=142516>

Siegel, D. S., Waldman, D. A., Atwater, L. E., Link, A. N., (2004), "Toward a model of the effective transfer of scientific knowledge from academicians to practitioners; qualitative evidence from the commercialization of university technologies", *Journal of Enigeering and Technology management*, 21, 115-142

Van Dierdonck, R., Debackere, K., Engelen, B., (1990), "University-industry relationships: How does the Belgian academic community feel about it?", *Research Policy*, 19, 551-566

Westerheijden, D. F., Hulpiau, V., Waeytens, K., (2007), "From Design and Implementation to Impact of Quality Assurance: An overview of Some Studies into what Impacts Improve", *Tertiary Education and Management*, 13, 4, 295-312

Yin, R. K., (1994), "*Case study research: Design and Methods*", SAGE Publications

Zucker, L. G., & Darby, M. R., (1996), "Star scientists and institutional transformation: Patterns of invention and innovation in the formation of the biotechnology industry", *Proc. Natl. Acad. Sci. USA*, 93, 12709-12716